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EVALUATION OF PROCEDURES FOR ONE-MONTH-AHEAD FORECASTS OF PRICES RECEIVED BY FARMERS

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EVALUATION OF PROCEDURES FOR ONE-MONTH-AHEAD FORECASTS OF PRICES RECEIVED BY FARMERS, by Gary Keough, Research and Applications Division; and C. P. Miles, Estimates Division, National Agricultural Statistics Service, U.S. Department of Agriculture, Washington DC 20250, Research Report No. SRB 91-06, April 1991.

ABSTRACT

The National Agricultural Statistics Service (NASS) publishes State level midmonth prices received by farmers on the last working day of each month. These midmonth prices are estimates of prices as of the middle of the month. They are not forecasts of the entire-month price. NASS publishes entire-month prices a month later after entire-month data has been analyzed. This report examines one-month-ahead price forecasting procedures to replace the midmonth price.

Procedures examined are: Box-Jenkins transfer function model (TFM), a composite of the midmonth and TFM forecast, regression model (RM) forecasts, and a composite of the midmonth and RM forecast. Two TFM model updating procedures were also evaluated. One process updated models monthly. The other process updated the models quarterly. Both model updating procedures performed about equally. No forecasting procedure dramatically outperformed the midmonth price. Therefore, no changes are recommended to the current operational program.

Key Words: Box-Jenkins transfer functions, regression, composite.

ACKNOWLEDGEMENTS

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SUMMARY

The National Agricultural Statistics Service (NASS) publishes State level midmonth prices received by farmers on the last working day of each month. Livestock commodity prices are based on data reported for the first 2 weeks of the month while crop commodity prices are based on data reported for the middle of the month (from the 13th through the 17th). These are price estimates for the middle of the month, not forecasts of the entire-month price. However, some data users use midmonth prices as forecasts. Entire-month prices are published a month later after entire-month volume and sales data have been analyzed.

NASS Estimates Division's request for a price forecasting procedure to replace the midmonth price motivated this research. Donaldson and Klugh[2] showed a composite of the current midmonth price and a Box-Jenkins transfer function model forecast could outperform the midmonth alone for some commodities at the national level. The goal of this project was to evaluate alternative procedures for State level prices.

One-month-ahead forecasts of entire-month prices for seven commodities in nine States were evaluated. A total of 39 State/commodity combinations were evaluated. Of these 39 combinations, 22 are State/livestock commodity combinations and 17 are State/crop commodity combinations. NASS publishes over 400 midmonth prices each month. Commodities were chosen for their importance in the Index of Prices Received by Farmers. States were chosen to get a geographical mix.

Though the current midmonth price is not a forecast, we evaluated its performance as such. Other forecasting procedures evaluated were Box-Jenkins transfer function model (TFM) forecasts, regression model (RM) forecasts, and two composite forecasts. One composite uses the midmonth and TFM forecasts. The other uses the midmonth and RM forecasts. The composite process weights forecasts from each method by the inverse of the method's historic mean square error divided by the sum of the two procedures' inverse mean square errors. Historical mean square errors were estimated from the previous 12 forecasts.

Two TFM model updating processes were also evaluated. One process updated models monthly. The other process updated the models quarterly. RM models were updated monthly. Autobox Plus 2.0 software was used for generating TFM forecasts. The package automatically identifies the model, estimates coefficients, and generates a forecast.

Crop commodity TFM's and RM's were developed starting with January 1978 data. Livestock commodity TFM's and RM's were developed starting with January 1981 data. This corresponds to the use of probability sampling. Monthly forecasts for January 1986 through

December 1988 were generated for each of the 39 State/commodity combinations. Of these forecasts, 1986 monthly forecasts were only used to calculate weights for composite forecasts. Evaluation statistics used 1987 and 1988 monthly forecasts. Official entire-month prices are considered truth.

No procedure dramatically outperformed the midmonth price. Each procedure had a mean absolute percent error (MAPE) of just over three percent at the national level. Year-to-year differences were minor. At the commodity level, all procedures performed about the same within a commodity, however, some commodities had lower MAPE's than others.

Since no forecasting procedure dramatically outperformed the midmonth price, no changes to the current operational program are recommended.

Evaluation of Procedures for One-Month-Ahead Forecasts of Prices Received by Farmers

Gary Keough and C. P. Miles

INTRODUCTION

The National Agricultural Statistics Service (NASS) publishes midmonth prices received by farmers on the last working day of each month in the publication "Agricultural Prices". Livestock commodity prices are based on data reported for the first 2 weeks of the month while crop commodity prices are based on data reported for the middle of the month (from the 13th through the 17th). These are price estimates for the middle of month, not forecasts of the entire-month price. However, some data users use the midmonth prices as forecasts. Entire-month price estimates are published at the end of the following month. These estimates are based on entire-month marketings or purchases that are used to arrive at a weighted price[5]. NASS publishes over 400 midmonth prices each month.

NASS Estimates Division's request for a price forecasting procedure to replace the midmonth price motivated this research. Donaldson and Klugh[2] showed a composite of the current midmonth price and a Box-Jenkins transfer function model forecast could outperform the midmonth alone for some commodities at the national level. The goal of this project was to examine how alternative procedures performed at the State level.

Seven commodities were selected by their relative importance in the Prices Received Index and their having nearly complete data series. Nine States were chosen for a mix of geographic areas. The following table lists the State/commodity combinations.

Table 1 -- States and commodities studied

State	Commodities
California	cattle, calves, wheat, cotton
Oregon	cattle, calves, wheat
Montana	cattle, calves, wheat
Iowa	cattle, calves, hogs, corn, soybeans
Indiana	cattle, calves, hogs, corn, soybeans, wheat
Oklahoma	cattle, calves, wheat, cotton
Missouri	cattle, calves, hogs, corn, soybeans, wheat
Georgia	cattle, calves, hogs, corn, soybeans, cotton
Florida	cattle, calves

A total of 39 State/commodity combinations were evaluated. Of these 39 combinations, 22 are State/livestock commodity combinations and 17 are State/crop commodity combinations.

Monthly livestock prices from January 1981 through December 1988 and monthly crop prices from January 1978 through December 1988 are used for model building and evaluation. These starting times correspond to the use of probability sampling for monthly prices. Evaluation statistics are calculated using 1987 and 1988 monthly forecasts.

Some months there may not be enough commodity sales to make a midmonth or entire-month price. In these cases, the previous entire-month price was substituted. Usually, less than 5 prices were missing for a series. However, Oklahoma cotton had 31 missing prices between the midmonth and entire-month series.

METHODOLOGY

FORECASTING PROCEDURES

In this analysis, the midmonth price was evaluated as if it were a forecast even though it is not published as such. Other forecasting procedures evaluated were the Box-Jenkins transfer function model (TFM), regression model (RM), and two composite forecasts. One composite uses the midmonth and TFM forecasts, the other uses the midmonth and RM forecasts.

Midmonth prices

Crop commodity midmonth prices are based on data reported for the middle of the month (from the 13th through the 17th) from probability surveys. Livestock prices are ratio estimates where a percent change from the previous month is applied to the previous month's entire-month price. This percent change is estimated from data for the first 2 weeks of the month.

RM forecasts

Simple linear regression models were developed using the entire-month price as the dependent variable (Y), and the midmonth price as the independent variable (X). The equation,

$$\hat{Y}_R = b_0 + b_1(X)$$

was fit to the data. The regression coefficients, b_0 and b_1, were estimated using ordinary least squares. Coefficients were estimated using only historic data, and they were re-estimated every month.

TFM forecasts

Autobox Plus 2.0 uses Box-Jenkins methodology for determining time series models. This is a three-step iterative approach[1]. Details of the methodology will not be presented here. However, a general description of times series models will be given. Examples of models will be demonstrated.

Time series models differ from regression models in that time series models depend on the order the observations are generated. In regression models, the order of the observations has no effect on the model. Time series models use historic values of a series to predict future values. Some time series models try to use seasonal and cyclic patterns.

Transfer functions are a subdivision of time series models. Transfer functions include leading indicators, or input variables, to forecast values of an output series[1]. In this sense they transfer changes of an input variable to the output variable. Transfer functions also can incorporate information about the output series alone. The Autobox Plus software can measure the relationship between the input and output series, and the historic relationship of the output series with itself. If the input series does not provide sufficient information, the software will exclude it from the model.

EXAMPLES OF MODELS

The following is a simple example of a Box-Jenkins model.

$$\hat{Y}_{TFMt}^{1/2} = 1.829 + [0.978\ (X_t^{1/2} - 1.825)]$$

This example looks very similar to a regression model where the variables have been transformed by taking the square roots. This equation uses an input variable, X, for which we have a value at time t, to forecast an output variable, Y. The value 1.829, which looks like an intercept, is the mean of the transformed output series. The term, $X_t^{1/2} - 1.825$, is the square root of the current input value $X_t^{1/2}$ minus the mean (1.825) of the transformed input series. This term is then multiplied by the coefficient, 0.978. In this example, a forecast is made by transferring to the output series' mean, a portion of the difference between the input series' current value and its mean.

A more complicated model form, that takes 12 month seasonality into account is:

$$\hat{Y}_t = Y_{t-1} + (Y_{t-12} - Y_{t-13}) + (0.526)[X_t - X_{t-1} - (X_{t-12} - X_{t-13})].$$

Here, the terms $(Y_{t-12} - Y_{t-13})$ and $(X_{t-12} - X_{t-13})$ bring the output and input series changes from a year ago into the model.

Composite Forecasts

Composite forecasts are weighted averages of forecasts. By using optimum weights, a best available composite forecast will outperform or equal the best individual forecast. It cannot do worse[3].

The inverse mean square error composite method weights the forecasts by the ratio of a forecasting procedure's historic inverse mean square error and the sum of all forecasting procedures' historic inverse mean square errors. Therefore, the sum of weights equals one. This technique gives more weight to forecasts that perform better over time. Mean square errors for this analysis were calculated using errors from the previous 12 forecasts. M_{it}, the mean square error of forecast i for month t, is calculated by;

$$M_{it} = \left(\frac{1}{12}\right) \sum_{k=t-12}^{t-1} (\hat{Y}_{ik} - Y_k)^2,$$

where

$\hat{Y}_{ik}$ = the value of forecast i for month k, and

Y_k = the official entire-month price for month k.

The composite forecast for month t, C_t, is calculated as:

$$C_t = \frac{\sum_{i=1}^{r} (\hat{Y}_{it} \times W_{it})}{\sum_{i=1}^{r} (W_{it})}$$

where

$$W_{it} = \frac{1}{M_{it}},$$

and r indices the number of different forecasting procedures used by the composite. For this analysis r = (1,2).

AUTOBOX PLUS 2.0 SOFTWARE

Autobox Plus 2.0 by AFS generated the TFM forecasts. This software package does automated time domain time series analysis. The user tells the program what data and options to use and the package identifies the model form, estimates the coefficients, then generates the forecast. Coefficients are estimated using a nonlinear least squares estimation procedure that is based on the Marquardt algorithm[14].

ANALYSIS STATISTICS

Evaluation statistics presented in this report are the mean percent error (MPE) and mean absolute percent error (MAPE). These procedures measure performance on a relative basis. This allows for across commodity comparisons. A procedure that misses by 1 percent is better than a procedure that misses by 2 percent. The mean percent error provides an estimate of the forecast method's relative bias. The MAPE provides a relative measure of the size of the average forecast error. Charts showing the cumulative distribution of absolute percent error are also presented. The higher the percentage of forecasts with small absolute percent errors, the better the procedure.

To measure a procedure's performance, let Y_t be the entire-month price at time t and let $\hat{Y}_t$ be the procedure's forecast at time t; then the forecast error can be defined as:

$$e_t = Y_t - \hat{Y}_t.$$

The evaluation statistics are calculated as:

$$(\text{MPE}) = \left[\sum_t (e_t \ / \ Y_t)/n \right] \times 100$$

$$(\text{MAPE}) = \left[\sum_t |e_t \ / \ Y_t|/n \right] \times 100$$

RESULTS

Updating Procedures

Table 2 compares the MPE's and MAPE's for the two TFM model updating procedures for crop and livestock commodities. The table shows very little difference between the two updating procedures' performance within class. The bias, as indicated by the MPE, is slightly larger for the monthly procedures for crops but smaller for livestock. The MAPE's are practically the same for both procedures. The monthly forecasts were used to calculate composite forecasts because RM forecasts are also from monthly updated models.

Table 2 -- Comparison of analysis statistics by transfer function model updating procedure for crop and livestock commodities

Models Updated	Class	Mean Percent Error	Mean Abs. % Error
Monthly	Crops	0.31	3.50
Quarterly	Crops	0.22	3.47
Monthly	Lvsk.	1.20	3.48
Quarterly	Lvsk.	1.32	3.50

Forecasting Performance

Donaldson and Klugh[2] showed transfer function models alone and when composited with the midmonth price performed better than the midmonth price at the national level for selected commodities. These conclusions were based on analysis of monthly forecasts for the 1987 calender year. Therefore, evaluation statistics were calculated from only 12 forecasts. For this report, evaluation statistics will be presented at more aggregated levels and in some cases across 2 years, or 24 monthly forecasts.

As mentioned previously, forecasts for 39 State/commodity combinations were produced on a monthly basis for 1987 and 1988. In total, 936 prices were forecasted for each procedure. Of these, 408 are livestock commodity forecasts, 528 are crop commodity forecasts.

Tables 3-6 present MPE results summarized at different levels. The asterisks in the tables indicate the minimum MPE in absolute value for each commodity and year. The last column in each table is the maximum decrease in absolute value of MPE from the midmonth. This is the largest difference between the absolute value of the midmonth's MPE and the minimum absolute MPE of all forecasting

procedures. In some cases, the midmonth's MPE is the minimum so the difference is zero. With the exception of 1987 Cotton, these maximum decreases are about one percent or less.

In Table 3, no one procedure substantially produced more minimum MPE's in absolute value than the others. The TFM-midmonth composite and the midmonth each produced four minimums while the TFM produced three minimums.

Table 3 shows the midmonth price has MPE's less than 1 percent for the most commodities. The other procedures have MPE's within plus or minus one percent for most commodities.

Tables 4-6 show that as groups are combined, the midmonth bias approaches zero. Table 6 shows the midmonth has a slight negative bias while the other procedures show a small positive bias.

Table 3 -- Mean percent errors by commodities, by forecasting procedure, by year

Commodity	Year	n	Mid-month	Forecasting Procedures: RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in |MPE| from midmonth
Corn	87	48	0.78	-2.03	*-0.16	-0.55	0.43	0.62
Corn	88	48	0.72	*-0.05	0.89	0.34	0.82	0.67
87 minus 88			0.06	-1.98	-1.05	-0.89	-0.39	
Cotton	87	36	-2.55	-2.26	* 0.07	-2.33	-0.87	2.48
Cotton	88	36	0.37	-0.70	-1.02	*0.23	-0.41	0.14
87 minus 88			-2.18	-1.56	1.09	-2.10	-.046	
Soybeans	87	48	-0.41	-1.10	0.27	-0.65	*-0.13	0.28
Soybeans	88	48	-0.54	-0.36	0.22	-0.46	*-0.11	0.43
87 minus 88			0.13	-0.74	0.05	-0.19	-0.02	
All Wheat	87	72	1.41	-0.49	0.87	* 0.35	0.95	1.06
All Wheat	88	72	* 0.14	-0.69	0.54	-0.31	0.29	0.00
87 minus 88			1.27	0.20	0.33	0.66	0.66	
Beef Cattle	87	108	*-0.13	1.79	2.08	0.77	0.68	0.00
Beef Cattle	88	108	-0.37	1.53	0.94	0.46	* 0.22	0.15
87 minus 88			-0.24	0.26	1.14	0.31	0.46	
Calves	87	108	* 0.18	2.53	2.99	1.30	1.31	0.00
Calves	88	108	-0.51	1.08	0.30	0.22	*-0.10	0.41
87 minus 88			-0.69	1.45	2.69	1.08	1.41	
Hogs	87	48	-0.54	-0.36	*-0.30	-0.44	-0.43	0.24
Hogs	88	48	*-0.34	-0.73	-0.67	-0.52	-0.51	0.00
87 minus 88			-0.20	0.37	0.37	0.08	0.08	

* Minimum MPE in absolute value.

Table 4 -- Mean percent errors by crop and livestock commodities, by year

Commodity	Year	n	Mid-month	RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in |MPE| from midmonth
				Forecasting Procedures				
Crop	87	204	* 0.13	-1.31	0.34	-0.57	0.25	0.00
Crop	88	204	* 0.15	-0.46	0.27	-0.18	0.20	0.00
87 minus 88			-0.02	-0.85	0.07	-0.39	0.05	
Livestock	87	264	*-0.08	1.70	2.02	0.77	0.74	0.00
Livestock	88	264	-0.42	0.93	0.39	0.18	*-0.05	0.37
87 minus 88			0.34	0.77	1.63	0.59	-0.79	

* Minimum MPE in absolute value.

Table 5 -- Mean percent errors by year

Year	n	Mid-month	RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in |MPE| from midmonth
			Forecasting Procedures				
87	468	* 0.01	0.39	1.29	0.18	0.52	0.00
88	468	-0.17	0.32	0.34	* 0.03	0.06	0.14
87 minus 88		-0.18	0.07	0.95	0.15	0.46	

* Minimum MPE in absolute value.

Table 6 -- Mean percent errors calculated over all forecasts

n	Mid-month	RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in MAPE from midmonth
		Forecasting Procedures				
936	*-0.08	0.36	0.81	0.10	0.29	0.00

* Minimum MPE in absolute value.

In Tables 7-10, the maximum decrease in MAPE from the midmonth is the largest difference between the midmonth's MAPE and the minimum MAPE of all forecasting procedure. This difference was always less

than one percent. Again, in some cases the midmonth MAPE is the smallest value, so the difference is zero. The asterisks in the tables indicate the minimum MAPE for each commodity and year.

Table 7 shows the TFM-midmonth composite had more minimum MAPE's (seven) than any other procedure. Generally, one or both of the composites had a MAPE smaller than the midmonth, and the midmonth tended to have smaller MAPE's than the RM and TFM. The midmonth, however, had the minimum MAPE for all livestock commodities in 1987, but these differences are too small to be meaningful.

Table 7 also shows some commodities have higher MAPE's than others. Cotton was by far the hardest commodity to forecast. However, the reader must remember only three of the nine States used in this study make midmonth cotton prices and for some months there was not enough cotton sold to set a midmonth or entire-month price. Soybeans and Hogs had the lowest MAPE's of any commodity.

Year-to-year differences (indicated by "87 minus 88") were small for most commodities. Only cotton and soybeans had MAPE's with year-to-year differences greater than one percent.

State level MAPE's were calculated but are not presented because trends generally were similar to Table 7. In some States, however, one observation heavily influenced the MAPE.

Tables 8-10, show each procedure's MAPE when calculated over different levels. The TFM-midmonth composite usually had the minimum MAPE, however, differences between MAPE's were small with all procedures producing MAPE's around three percent.

Table 7 -- Mean absolute percent errors by commodity, by year

Commodity	Year	n	Mid-month	Forecasting Procedures: RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in |MPE| from midmonth
Corn	87	48	3.13	3.06	2.92	2.54	*2.29	0.84
Corn	88	48	3.34	*3.05	3.50	3.14	3.10	0.29
87 minus 88			-0.21	0.01	-0.58	-0.60	-0.71	
Cotton	87	36	6.53	5.88	6.21	6.12	*5.82	0.71
Cotton	88	36	4.42	*4.00	5.27	4.09	4.84	0.42
87 minus 88			2.22	1.88	0.96	2.03	0.98	
Soybeans	87	48	1.17	1.44	1.26	1.21	*1.14	0.03
Soybeans	88	48	2.52	2.54	2.79	2.52	*2.45	0.07
87 minus 88			-1.35	-1.10	-1.53	-1.29	-1.31	
All Wheat	87	72	3.49	3.37	3.92	*3.22	3.36	0.27
All Wheat	88	72	3.61	3.51	*3.18	3.51	3.31	0.43
87 minus 88			-0.12	-0.14	0.74	-0.29	0.05	
Beef Cattle	87	108	*3.04	3.36	3.85	3.09	3.11	0.00
Beef Cattle	88	108	3.31	3.51	3.79	3.29	*3.23	0.08
87 minus 88			-0.27	-0.15	0.06	-0.20	-0.12	
Calves	87	108	*3.16	3.75	4.61	3.25	3.24	0.00
Calves	88	108	3.29	3.36	3.19	3.20	*2.94	0.35
87 minus 88			-0.07	0.39	0.42	0.05	0.30	
Hogs	87	48	*1.57	1.69	1.87	1.64	1.68	0.00
Hogs	88	48	1.71	1.76	1.72	1.68	*1.65	0.06
87 minus 88			-0.14	-0.07	0.15	-0.04	0.03	

* Minimum MAPE.

Table 8 -- Mean absolute percent errors by crop and livestock commodities, by year

Commodity	Year	n	Mid-month	Forecasting Procedures: RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in |MPE| from midmonth
Crops	87	204	3.39	3.29	3.46	3.10	*3.02	0.37
Crops	88	204	3.43	*3.26	3.53	3.29	3.33	0.17
87 minus 88			-0.04	0.03	-0.07	-0.19	-0.31	
Livestock	87	264	*2.82	3.21	3.80	2.89	2.90	0.00
Livestock	88	264	3.01	3.13	3.17	2.96	*2.82	0.19
87 minus 88			-0.19	0.08	0.73	-0.07	0.08	

* Minimum MAPE.

Table 9 -- Mean absolute percent errors, by year

Year	n	Mid-month	Forecasting Procedures: RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in MAPE from midmonth
87	468	3.07	3.25	3.65	2.98	*2.95	0.12
88	468	3.20	3.19	3.33	3.11	*3.04	0.16
87 minus 88		-0.13	0.06	0.32	-0.13	-0.09	

* Minimum MAPE.

Table 10 -- Mean absolute percent errors calculated over all forecasts

n	Mid-month	Forecasting Procedures: RM	TFM	RM-Mid month Comp.	TFM-Mid month Comp.	Maximum Decrease in MAPE from midmonth
936	3.13	3.22	3.49	3.05	*3.00	0.13

* Minimum MAPE.

Charts 1-5 show the cumulative distribution of the absolute percent errors. The larger the percentage of forecasts within the smaller absolute percent error ranges, the better the procedure. For

example, from Chart 1, about 35 percent of the midmonth forecasts rounded to within plus or minus one percent of the official entire-month price.

Chart 1 shows the midmonth price, RM-midmonth composite, and TFM-midmonth composite performed nearly equal when considering all forecasts. The three procedures are usually within two percentage points of each other for all ranges, with the TFM-midmonth composite typically having the highest bar. The RM is typically just behind these three procedures while the TFM typically has the lowest bar in the smaller error ranges. This corresponds to the order of MAPE's in Table 10.

Charts 2-5 present the cumulative absolute percent errors for different breakdowns. These charts can be compared with Table 8. With the exception of Chart 4, there is little difference between charts. Chart 4 shows the TFM did not perform nearly as well as the other procedures for 1987 livestock commodity forecasts. This corresponds with the TFM's large MAPE for 1987 livestock commodities in Table 8.

Chart 1 Cumulative absolute percent errors, all commodities, 1987 and 1988

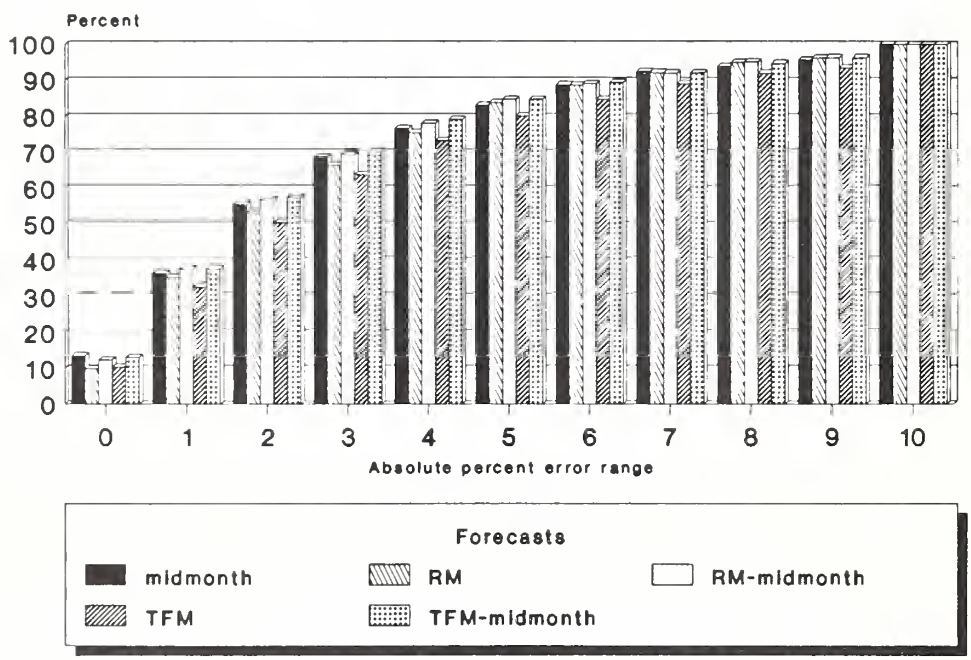


Chart 2 Cumulative absolute percent errors, crop commodities, 1987

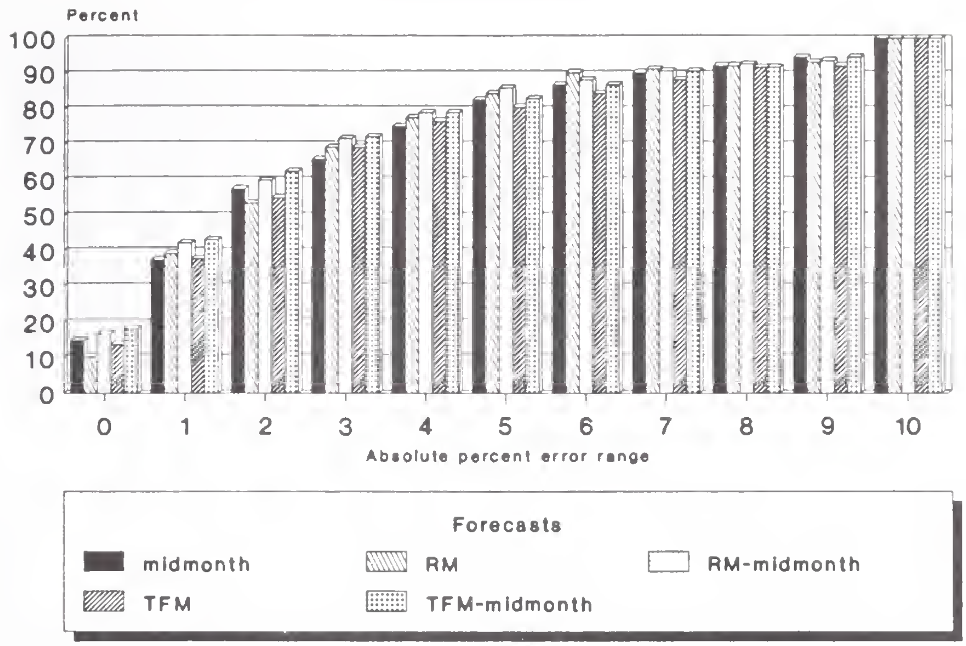


Chart 3 Cumulative absolute percent errors, crop commodities, 1988

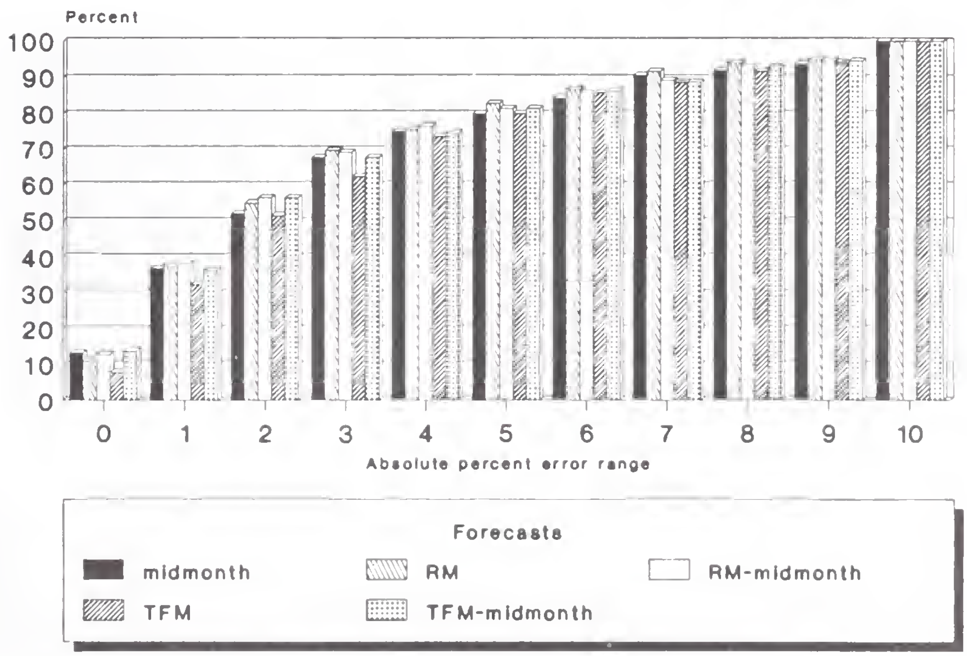


Chart 4 Cumulative absolute percent errors, livestock commodities, 1987

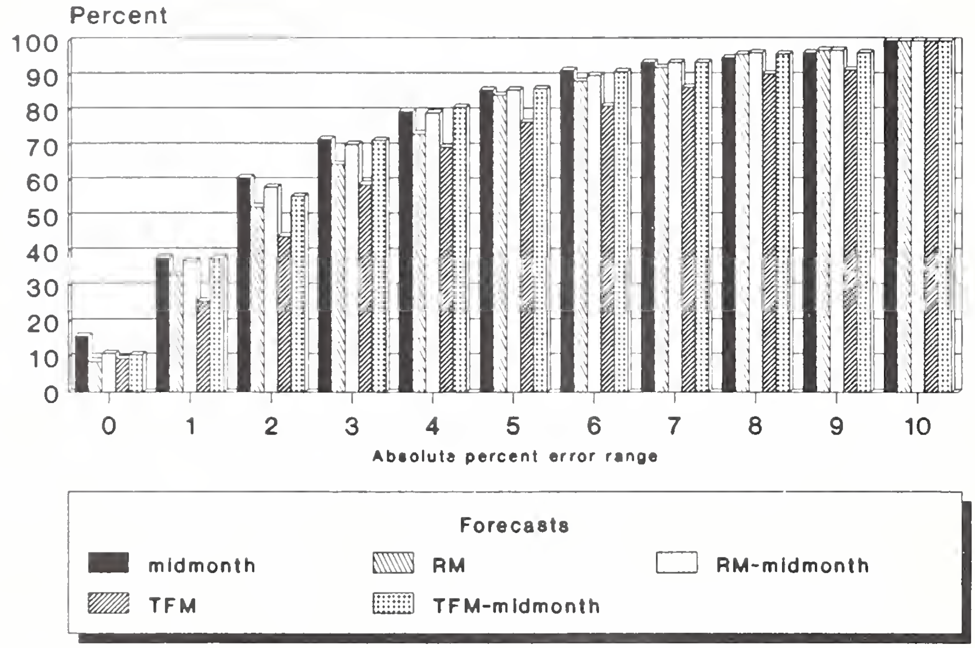
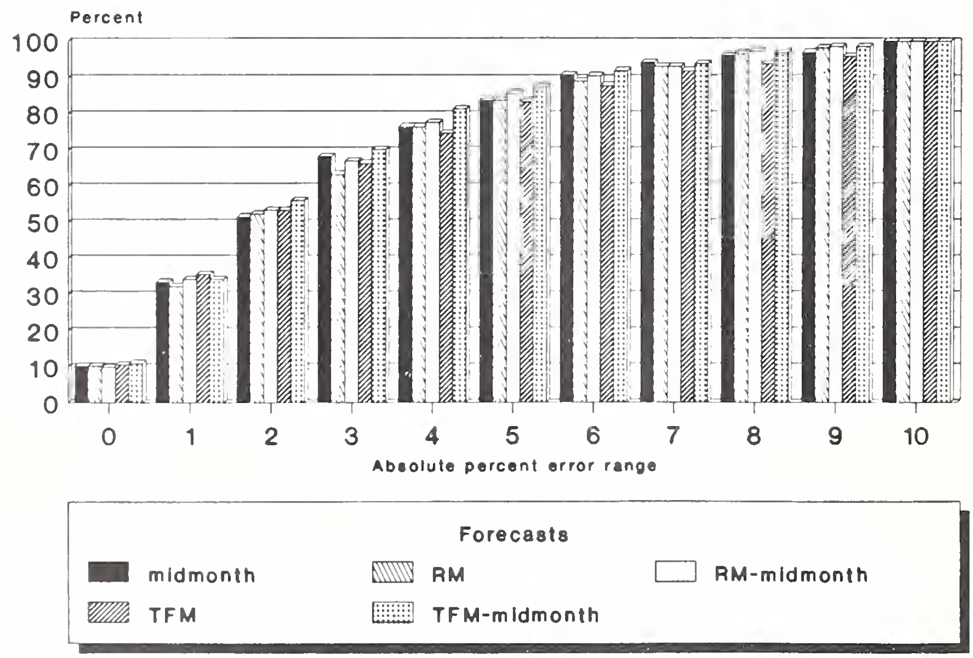


Chart 5 Cumulative absolute percent errors, livestock commodities, 1988



CONCLUSIONS

The objective of this study was to determine if alternative forecasting procedures could replace the prices received by farmers midmonth price. Also, two TFM model updating procedures were evaluated.

Results indicated that monthly and quarterly updated TFM models produced nearly equivalent forecasts. Also, no procedure dramatically outperformed the midmonth price. All procedures had MAPE's of just over three percent when calculated over all forecasts. There were minor differences at the year and commodity level. However, these differences are not large enough to be considered meaningful.

RECOMMENDATIONS

Because no procedure dramatically outperformed the current midmonth price, no changes to the current program are recommended.

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